RECORDS OF BEAKED WHALES IN QUEENSLAND

ROBERT A. PATERSON[1] AND STEPHEN VAN DYCK[1]

ABSTRACT

Beaked whale records in the Queensland Museum are confined to eleven specimens representing four species. They include the holotype of *Indopacetus pacificus* (Longman, 1926) and specimens of *Mesoplodon densirostris* (de Blainville, 1817) (5), *M. layardii* (Gray, 1865) (3) and *Ziphius cavirostris* (Cuvier, 1823) (2). Dental/mandibular relationships are demonstrated by radiographic methods in specimens of *M. densirostris* and *M. layardii*. Temperatures in Queensland waters are influenced by the warm East Australian Current and the composition of the collection reflects known distributions of the relevant species.

Key words: Ziphiidae, beaked whales, Queensland

INTRODUCTION

The Queensland coast borders the north-eastern aspect of the Australian continent and lies between latitudes 10°S and 28°S (Fig. 1). In contrast to the diversity of beaked whale species (Ziphiidae) recorded from the cooler waters of the southern hemisphere (Baker, 1983; Ross, 1984; Lichter, 1986), the collection in the Queensland Museum is limited to four species represented by eleven specimens.

Lichter (1986) described records of beaked whales from the Atlantic coast of South America and referred to isolation and climatic extremes among difficulties preventing examination of some fresh specimens. Goodall (1978) collected small cetacean specimens (including beaked whales) from Tierra del Fuego and also referred to the lack of early reports of strandings from that isolated and rugged region. Coastal Queensland is not subject to the isolation and climatic extremes of Patagonia and Tierra del Fuego but late reports of stranded or beach-cast specimens have resulted in the loss of important material even in recent years when cetaceans, including non-commercial species, have been accorded a high public profile (Anderson, 1985).

1) *Queensland Museum, P.O. Box 300, South Brisbane, Queensland, 4101 Australia*

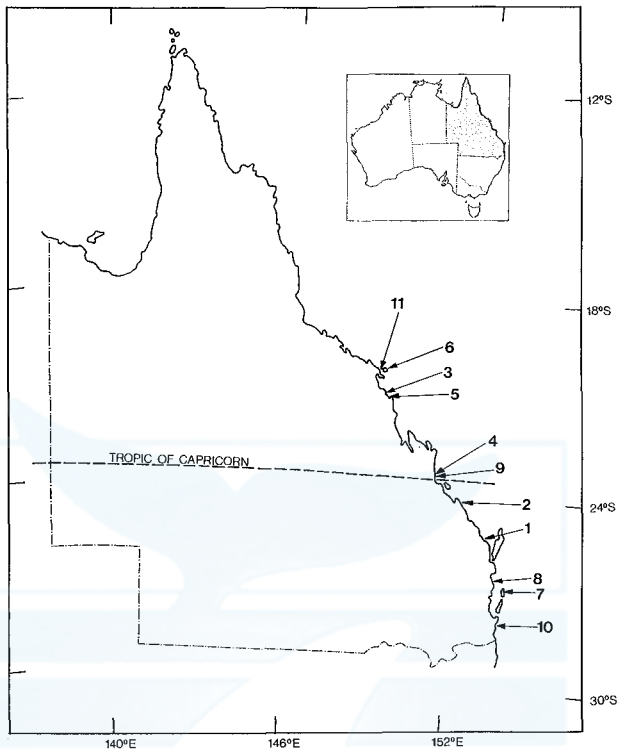

Fig. 1. Queensland coast showing collection sites of beaked whales referred to in Table 1.

SPECIES ACCOUNTS

The data are summarised in Table 1 and stranding locations are shown numerically in Fig. 1.

Ziphius cavirostris (Cuvier, 1823)

J3262 and JM5264 are illustrated in Fig. 2. Longman (1919) referred to a single tooth of J3262 when describing it as an immature female but the tooth has since been lost. JM5264 is from a whale which stranded at a popular, but secluded, camping site during the 1985 summer holidays. A photograph taken soon after stranding showed that colouration was pale grey dorsally and white ventrally. The decaying carcass was hacked and burned by campers in attempts to destroy it, and the success of those attempts can be judged by the extensive axe and fire damage to the skull. Sufficient material survived to demonstrate extensive posterior meso-rostral ossification which, together with the deep pre-narial basin, indicates that the specimen is that of an adult male (Hale, 1931).

TABLE 1. BEAKED WHALES IN THE QUEENSLAND MUSEUM

Map reference	Registration number	Date of stranding	Location	Sex and maturity	Length	Material	Reference
Ziphius cavirostris (CUVIER, 1823)							
1	J3262	December 1918	Nikenbah (25°19′S, 152°48′E)	F Immature	–	skull and mandible	Longman (1919)
2	JM5264	December 1985	Agnes Water (24°10′S, 151°53′E)	M Adult	–	skull	–
Indopacetus pacificus (LONGMAN, 1926)							
3	J2106	–	Mackay (21°01′S, 149°11′E)	M Adult	–	skull and mandible	Longman (1926)
Mesoplodon densirostris (DE BLAINVILLE, 1817)							
4	J4056	–	Yeppoon (23°08′S, 150°44′E)	M Adult	–	skull	Longman (1926)
5	J5330	–	Sarina (21°24′S, 149°19′E)	F Immature	–	skull and mandible	Paterson (1986a)
6	J13600	–	Whitsunday Group (20°10′S, 149°05′E)	M Adult	–	skull and mandible	〃 〃
7	JM4399	–	Moreton Island (27°12′S, 153°22′E)	M Adult	–	skull	〃 〃
8	JM6460	June 1986	Noosa (26°25′S, 153°07′E)	M Adult	4.01 m	almost complete skeleton	–
Mesoplodon layardii (GRAY, 1865)							
9	J2105	–	Emu Park (23°16′S, 150°50′E)	M Adult	–	skull, mandible and cervical vert.	Jaggard (1884)
10	J3280	December 1884	Southport (28°00′S, 153°26′E)	F Adult	3.7 m	incomplete vertebral column	De Vis (1884)
11	JM6198	August 1986	Whitsunday Passage (20°20′S, 148°50′E)	M Immature	4.7 m	complete skeleton	–

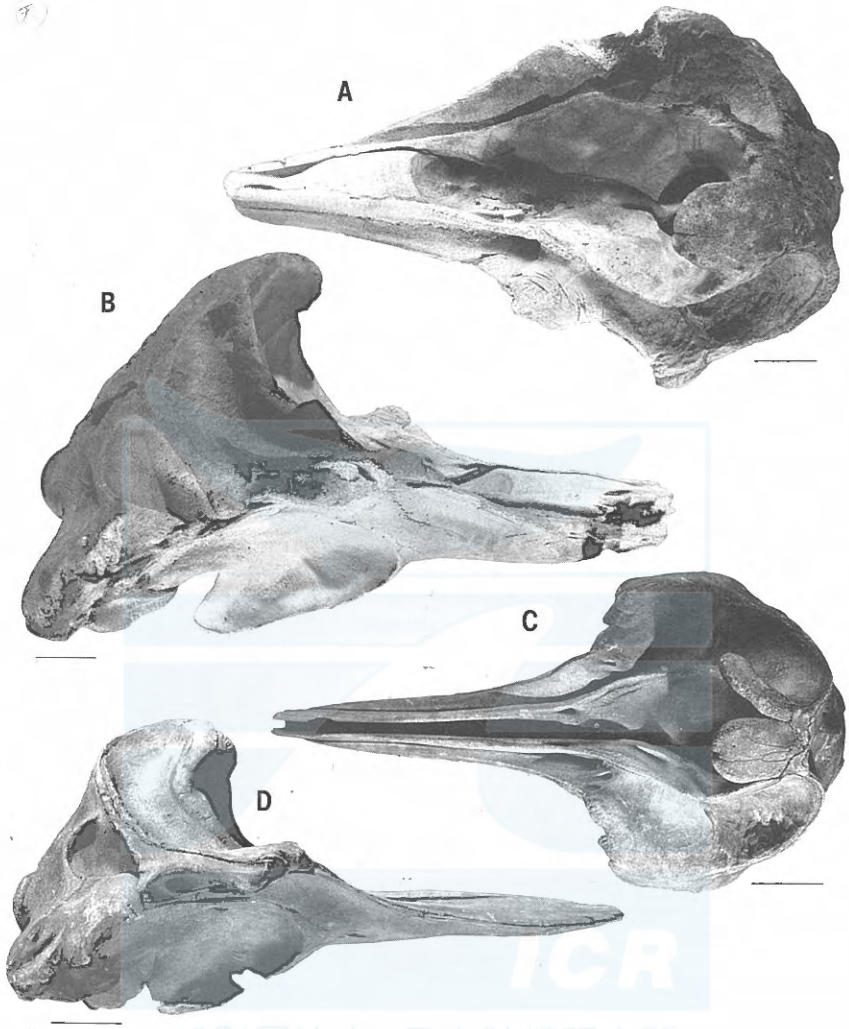

Fig. 2 *Ziphius cavirostris*.
Skull of JM 5264. A. Dorsal view.
B. Lateral view.
Skull of J3262. C. Dorsal view.
D. Lateral view.
(Scale in each case represents 10 cm)

Indopacetus pacificus (Longman, 1926)

The type specimen (J2106), a skull and mandible with the teeth missing, discovered at Mackay in 1882, was described by Heber A. Longman, a former director of the Queensland Museum. He named it *Mesoplodon pacificus*. Its status was confirmed by Moore (1968) who considered it to be an adult male and renamed it *Indopacetus pacificus* on

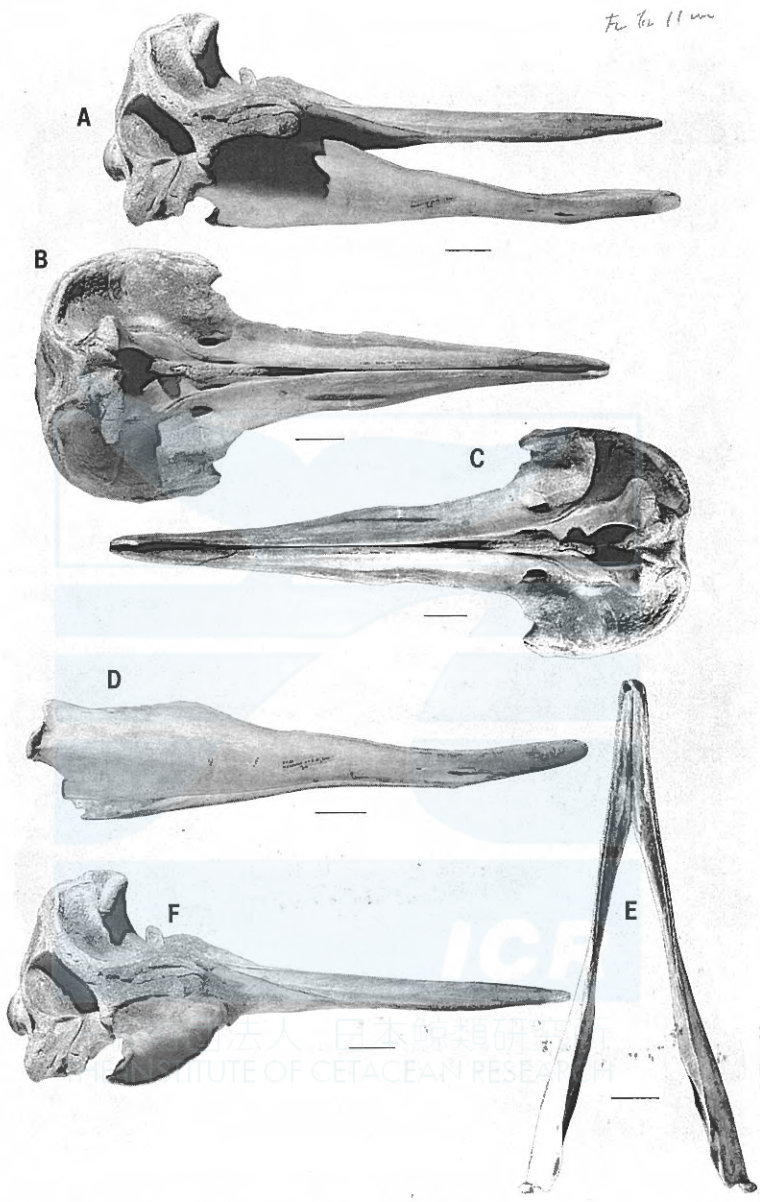

Fig. 3. *Indopacetus pacificus*, holotype, J2106.
A. Lateral view, skull and mandible.
B. Dorsal view, skull.
C. Additional dorsal view of skull, angled to show narial relationships.
D. Lateral view, mandible.
E. Dorsal view, mandible.
F. Lateral view, skull.
(Scale in each case represents 10 cm)

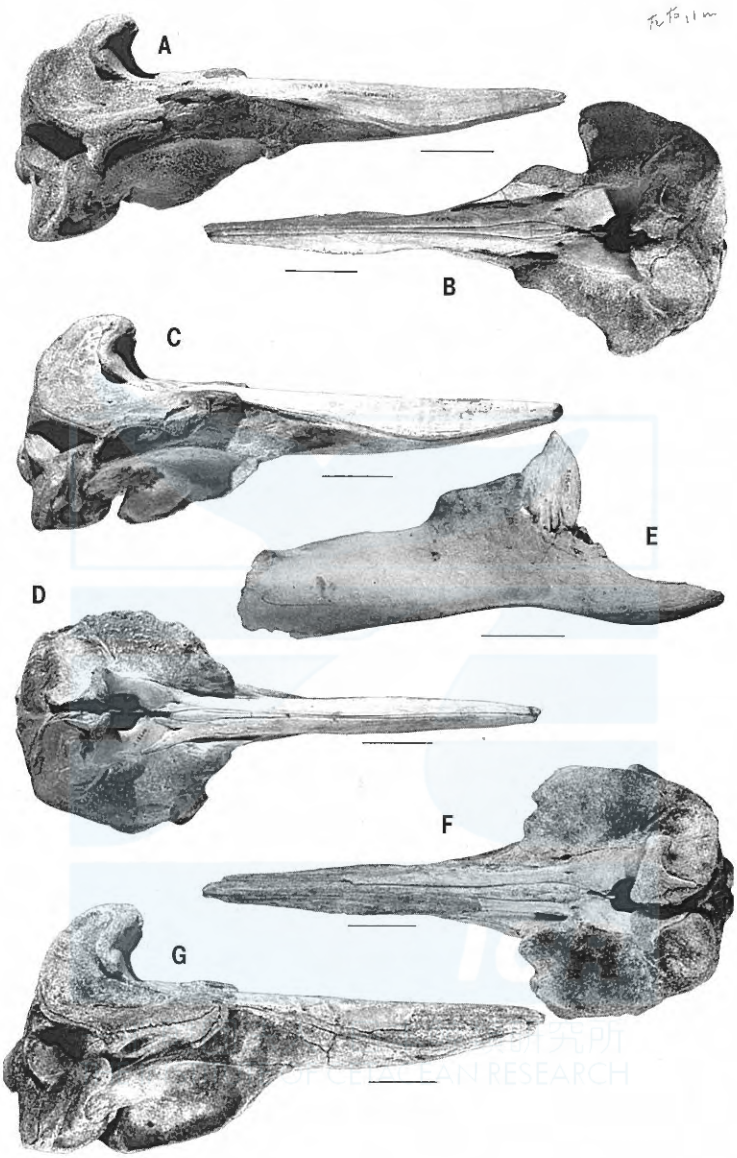

Fig. 4. *Mesoplodon densirostris*

Skull of J4056.	A. Lateral view.
	B. Dorsal view.
Skull and mandible of J13600.	C. Lateral view.
	D. Dorsal view.
	E. Lateral view, mandible.
Skull of JM4399.	F. Dorsal view.
	G. Lateral view.

(Scale in each case represents 10 cm)

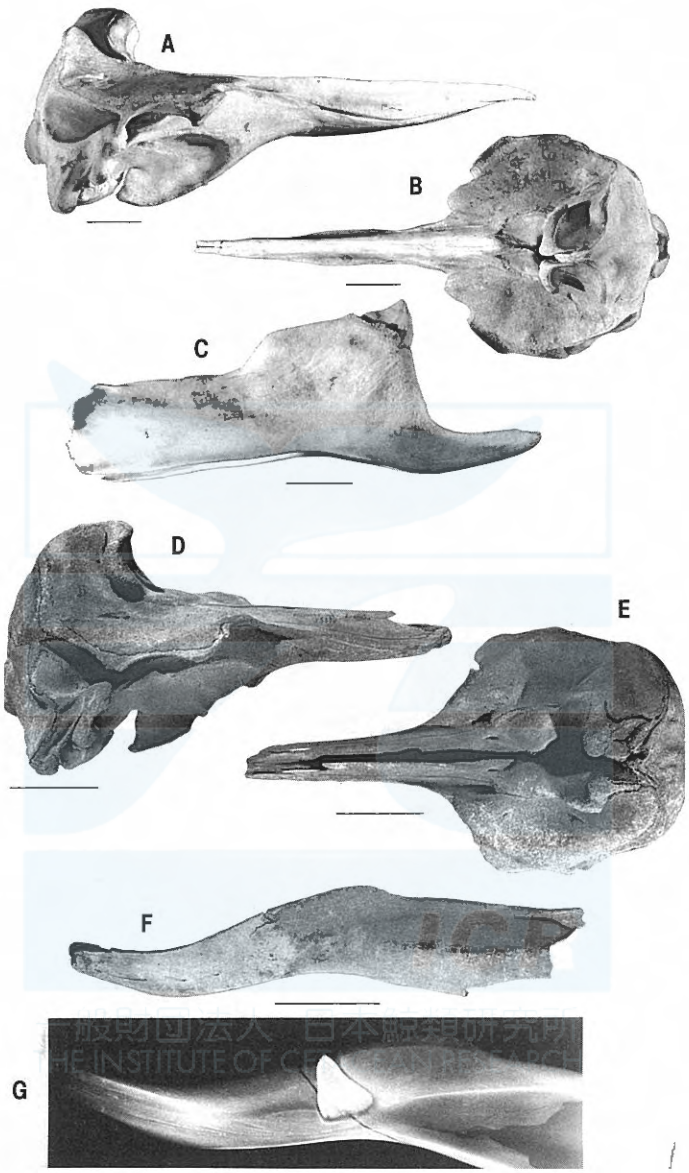

Fig. 5. *Mesoplodon densirostris*

Skull and mandible of JM6460.
A. Lateral view, skull.
B. Dorsal view, skull.
C. Lateral view, mandible.

Skull and mandible of J5330.
D. Lateral view, skull.
E. Dorsal view, skull.
F. Lateral view, mandible.
G. Lateral radiograph, mandible.

(Scale in each case represents 10 cm)

the basis of the deep horizontal grooving of the maxillary bone above the orbit, the short posterior processes on the premaxillary crest, and the lack of projection and poor indentation of the nasal bones. A second specimen, also a skull and mandible, discovered at Danane in Somalia was described by Azzaroli (1968). Moore (1972) considered this latter specimen to be immature as compared with the type specimen which is illustrated in Fig. 3.

Fig. 6. *Mesoplodon densirostris*.
Right tooth of J5330. A. Lateral view.
B. Ventral view.
(Scale in each case represents 10mm)

Mesoplodon densirostris (de Blainville, 1817)

Skulls and mandibles of J4056, J13600, JM4399, J5330 and JM6460 are illustrated in Figs 4 and 5.

The skull and mandible of J5330 are damaged. The dental/mandibular relationship is demonstrated radiographically. The shape of the unerupted left tooth (Fig. 5G) is typically female (Raven, 1942) and the complete lack of pulp space filling demon-

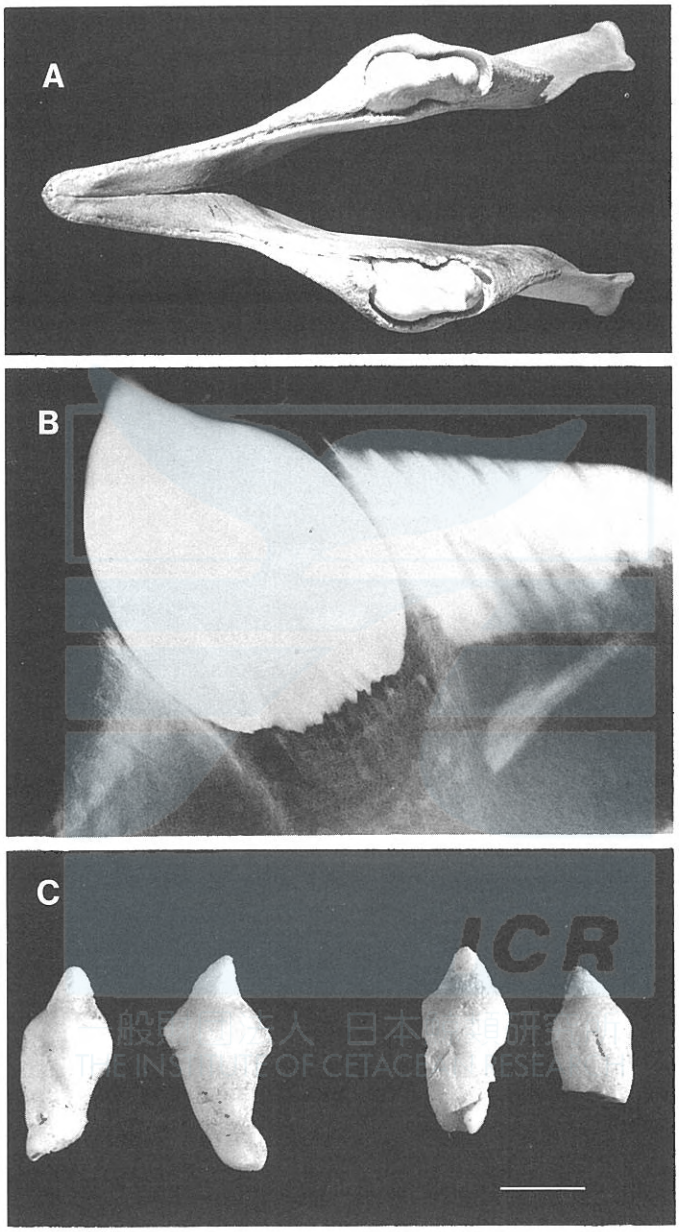

Fig. 7. *Mesoplodon densirostris*.
Mandible and teeth of JM6460.
A. Angled dorsal view, mandible.
B. Lateral radiograph showing tooth in situ (the anterior aspect of the mandible is to the left of the radiograph).
C. Rudimentary teeth (scale represents 5mm).

strated in its right counterpart (Fig. 6) indicates that the specimen is immature. The right tooth measures 50 mm in height, 39 mm in length and 12 mm in maximum width. Besharse (1971) noted that the teeth of adult and subadult female specimens of *Mesoplodon densirostris* from Midway Atoll measured 59 mm and 57 mm in height, respectively. The damaged state of J5330 precludes comparison with all the Midway data but the dental evidence alone indicates that the Queensland specimen is less mature than the Midway subadult.

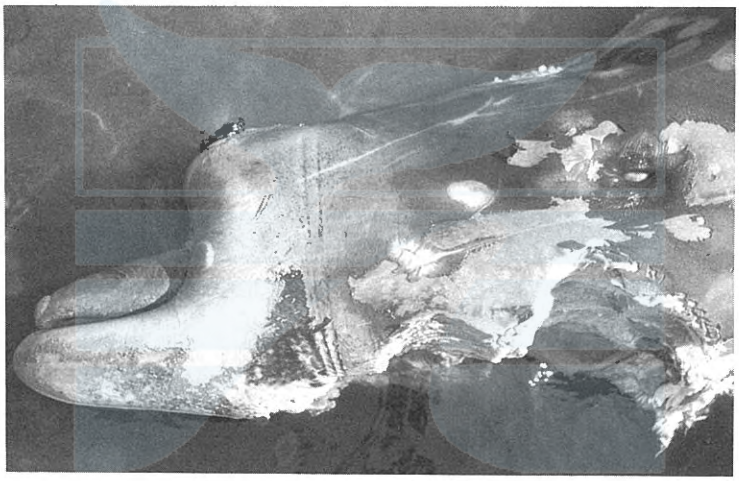

Fig. 8. Mauled head and upper body of *Mesoplodon densirostris* JM6460.

With the exception of J5330, the Queensland specimens are considered to be those of mature males. JM6460 was the only specimen examined in the fresh state. It measured 4.01 m in length. Colouration was blue-grey dorsally and light grey ventrally. Prominent oval scars, which coalesced ventrally, were similar to those described by Ross (1984). Mead, Walker and Houck (1982) discuss in detail the possible aetiologies of these scars. When the soft tissues anterior to the pair of erupted mandibular teeth were being cleaned, two rudimentary teeth were found in relation to each of them (Fig. 7). The rudimentary teeth had no mandibular attachment. Although primitive in form, they show greater differentiation than those found on occasions in the upper jaws of *Mesoplodon grayi* (Hale, 1932; Delhon, Crespo and Pagnoni, 1987) and *Ziphius cavirostris*

(Watson, 1981). Stalked barnacles identified as *Conchoderma auritum* (Linnaeus, 1767) were attached to the tip of each erupted tooth. Pringle (1963) noted a mass of seaweed about 6″ to 10″ [15 to 25 cm] in length attached to the tip of each tooth in a specimen of *Mesoplodon densirostris* from South Africa. Mead (1989) considered that the "seaweed" was *Conchoderma*. The erupted teeth of *M. densirostris* are non-occlusal and Clarke (1956) noted that attachment of *C. auritum* in sperm whales is also confined to teeth which do not occlude with their corresponding maxillary sockets because of the extreme anterior position of those teeth or, more uncommonly, mandibular deformity.

The vertebral formula for JM6460 is C.7; T.10; L.9; Cd.17 = 43. The first three cervical vertebrae are fused. Raven (1942) noted that such fusion did not involve the transverse processes. However, in JM6460 the transverse processes of C.1 and 2 are fused. It is likely that the smallest caudal vertebrae are absent as a result of mauling by sharks. This is supported by the fact that the posterior portion of C.17 is severed. Extensive post-mortem mauling of JM6460 also accounted for the destruction of abdominal and cranial soft tissues (Fig. 8).

Mesoplodon layardii (Gray, 1865)

Apart from some cervical, thoracic and lumbar vertebrae (all exhibiting complete epiphyseal fusion), the skeleton of J3280 has been lost. The skulls and mandibles of J2105 and JM6198 are illustrated in Fig. 9. The posterior inclination of the tooth, unerupted in the immature specimen (JM6198), is illustrated radiographically in Fig. 9G. Moore (1968) noted that the lateral position of the denticle at the apex of the tooth was characteristic of the species and those findings were confirmed in this specimen (Fig. 10).

The carcasss of JM6198 was decomposed when collected but it was identified as a male. The central epiphyses of the thoracic and lumbar vertebrae are unfused. The vertebral formula is C.7; T.9; L.10; Cd.19 = 45.

DISCUSSION

Temperatures in Queensland coastal waters are influenced by the warm East Australian Current and maximum and minimum temperatures occur during January/February and July/August, respectively. Annual maximum and minimum sea surface temperatures recorded by shark fishing contractors on the central Queensland coast were 28°C and 19°C, respectively (Paterson, 1986b). The two Queensland *Ziphius cavirostris* strandings occurred during summer, one *Mesoplodon layardii* stranded during summer and another during winter and one *Mesoplodon densirostris* stranded during winter.

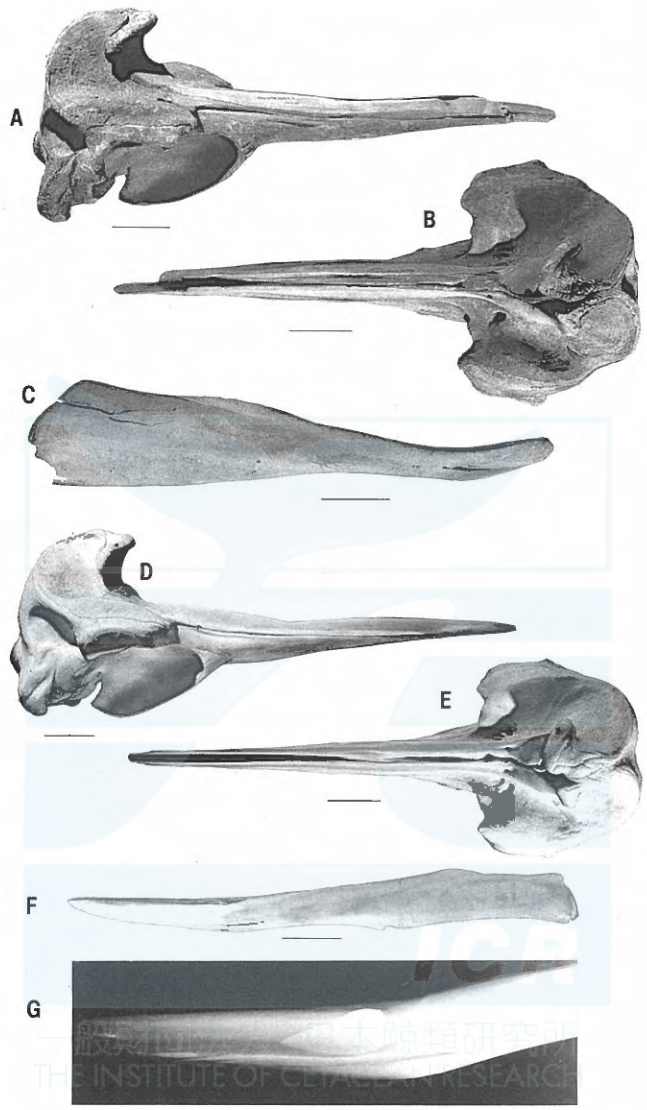

Fig. 9. *Mesoplodon layardii*

Skull and mandible of J2105.
- A. Lateral view, skull.
- B. Dorsal view, skull.
- C. Lateral view, mandible.

Skull and mandible of JM6198.
- D. Lateral view, skull.
- E. Dorsal view, skull.
- F. Lateral view, mandible.
- G. Lateral radiograph, mandible (the anterior aspect of the mandible is to the left of the radiograph).

(Scale in each case represents 10 cm)

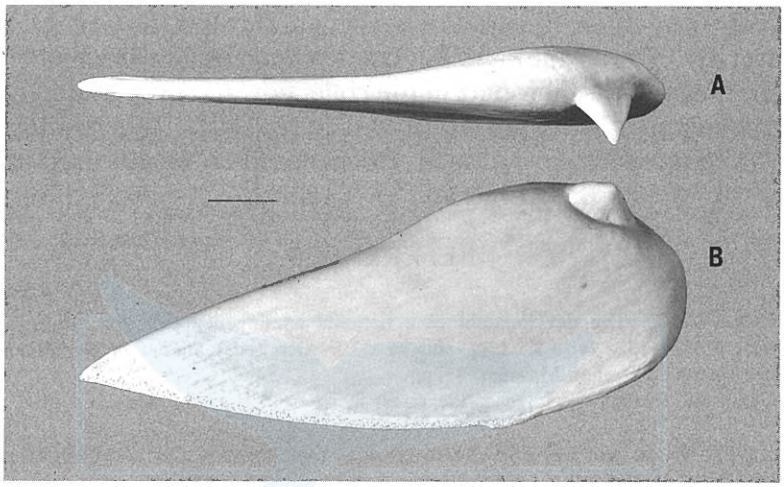

Fig. 10. *Mesoplodon layardii*.
Left tooth of JM6198. A. Dorsal view.
B. Lateral view.
(Scale in each case represents 10mm)

Ziphiids in the Queensland Museum reflect known distributions of the relevant species in Australian waters (Ross, 1989). Although the southernmost record of *Mesoplodon densirostris* is from Marrawah, latitude 40°50'S, in Tasmania (Guiler, 1966), the five specimens from Queensland indicate preference of the species for warm waters. *Mesoplodon layardii* is more commonly reported from cooler waters of the southern hemisphere (Dixon, 1980) and the southernmost record is from Heard Island, latitude 53°S (Guiler, Burton and Gales, 1987). However, the Queensland records indicate that the range of the species extends to latitudes lower than the Tropic of Capricorn.

Radiographic methods are useful to demonstrate dental/mandibular relationships in beaked whales.

Mead and Payne (1975) radiographically demonstrated the unerupted anterior pair of teeth in a female specimen of *Tasmacetus shepherdi*. Radiographic examination is of particular value in female and immature male specimens, where the teeth are unerupted.

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